

MISSOURI CONSERVATIONIST

VOLUME 83, ISSUE 9, SEPTEMBER 2022
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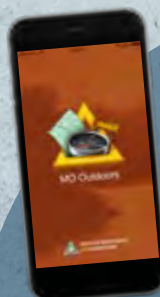
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Oak acorns

MISSOURI CONSERVATIONIST



ON THE COVER

Regal fritillary butterfly

📷 **NOPPADOL PAOTHONG**

100mm lens, f/5.6
1/125 sec, ISO 800

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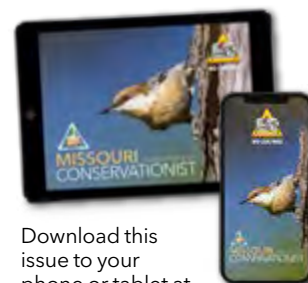
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Inbox



Letters to the Editor

Submissions reflect readers' opinions and may be edited for length and clarity. Email Magazine@mdc.mo.gov or write to us:

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BEAVERS

I appreciated the July 2022 article about beavers (*Beavers*, Page 16). They are truly amazing animals that are often misunderstood and treated as pests or threats.

Paul Goodwin
Springfield

MORE ABOUT BEAVERS

I learned a great deal from the beavers article. I didn't realize that the work beavers do helps provide habitat for plants, animals, birds, and insects. They also benefit humans by improving water quality.

Tom Reddick Desloge

LET'S SHOOT THE SMOKE

I loved reading *Shooting the Smoke* by Holly Dentner (July, Page 22). My great-grandfather, James Dreasler, worked and lived at Coot Mountain Lookout Tower. I never got to meet him, so reading about what his day-to-day would have been like brought me closer to him. Thank you.

Katherine Jaster Huffman via email

Being history minded, I enjoyed the brief history on MDC's fire towers. I look forward to reading Bob Frakes book, *Remembering Missouri's Lookout Towers: A Place Above the Trees*, which I have downloaded to my Kindle.

I always look forward to the *Missouri Conservationist*. I have been receiving it for most of my life. I am now 85.

Charles Nagel via email

Great article about the fire towers. We lived close to one in Miller County, near Ulman. You forgot to mention in this article that the agency would come

to the high schools in the area and get student volunteers to help control fires. This occurred when I was in high school in the 1950s.

Jim Elliott via email

My grandpa was a towerman for more than 30 years. My cousins and I have so many wonderful childhood memories of the tower where he worked. Talk about shenanigans — it's probably a good thing that tower can't talk. Maybe someday someone would like to know what's it's like for a kid to spend holidays and summer vacations around a lookout tower.

Debbie Reed Mountain View

A MONTH TO REMEMBER

I have been a subscriber to your magazine for many years. While it is always informative and well written, this issue (July) was top of the line.

Every article held my interest — I couldn't put the magazine down until I was finished. The article about snakes (*Dopplefangers*, Page 10) along with the amazing photos was mesmerizing. The beaver article was equally well written. Finally, the article *Shooting the Smoke* about the history of our fire towers reminded me of the time I was young enough to climb halfway up one. I had a relative who was a volunteer firefighter at the time. I cannot imagine how these men climbed these towers on a regular basis. Kudos to them.

Keep up the great work.

Gloria Cingano Imperial

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Send a note using our online contact form at mdc.mo.gov/commissioners.

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The Missouri Department of Conservation protects and manages the fish, forest, and wildlife of the state. We facilitate and provide opportunity for all citizens to use, enjoy, and learn about these resources.



Want to see your photos in the Missouri Conservationist?

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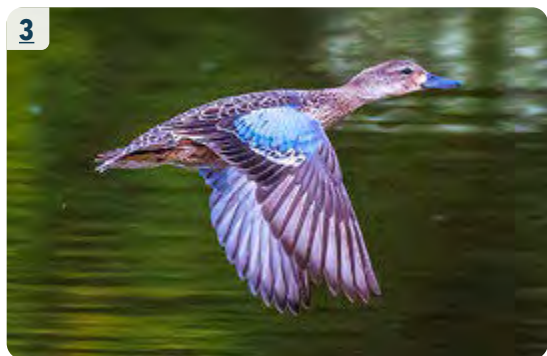
1 | Albino deer
by **Sandy Garst**,
via email

2 | Preseason
scouting with
Dad by **Barbara
Counts**, via email

3 | Blue-winged
teal by
Kurt Kirchmer,
via Flickr



2



3



Want another chance to see your photos in the magazine?

➔ In the December issue, we plan to feature even more great reader photos. Use the submission methods above to send us your best year-round pictures of native Missouri wildlife, flora, natural scenery, and friends and family engaged in outdoor activities. Please include where the photo was taken and what it depicts.

TAYLOR LYNN PHOTOGRAPHY



Up Front

with Sara Parker Pauley

✱ For years, I was a faithful listener to the radio show *Car Talk*, hosted by brothers and MIT graduates Tom and Ray Magliozzi. Known affectionately as Click and Clack, the Tappet brothers mixed diagnostic advice on ailing cars with humor and a touch of psychology. Utilizing Tom's technical skill, Ray's humor, along with playful banter with their guests, they made the world of cars captivating and the radio show award-winning.

I thought of that chemistry recently when touring MDC's Anita B. Gorman Conservation Discovery Center in Kansas City with two of MDC's landscape specialists, Cydney Ross and Alix Daniel, both of whom have lent their magic to the beautiful grounds. Cydney's background in art and design, combined with Alix's landscaping experience and a shared contagious passion for native plants, makes them a dynamic duo in the world of native landscaping. (Catch their monthly podcast, *Native Plants at Noon* — *Deep Roots* and learn more about growing natives on Page 11.)

I'm so fortunate in my role to be surrounded by such passionate professionals, like this magnetic twosome, who would get so excited about a blooming plant, migrating songbird, or newly discovered insect, that they would often forget about those touring with them in their gleeful discoveries and chatter with each other. Cydney told me later, "What I love most about my job is that I get to inspire people to find as much joy in native plants as I've found." Mission accomplished Cydney and Alix.

Sara Parker Pauley

SARA PARKER PAULEY, DIRECTOR
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Nature LAB

by Dianne Van Dien

Each month, we highlight research MDC uses to improve fish, forest, and wildlife management.

FISHERIES SCIENCE

Ohio Shrimp Surveys

✳ You might be surprised to learn that shrimp live in Missouri — two species do, in fact. The Mississippi grass shrimp is relatively numerous and spends its entire life in freshwater streams, but “the Ohio shrimp is rare in our state. It’s found primarily in the Mississippi River in southeast Missouri and migrates to saltwater for part of its life cycle,” explains MDC Fisheries Scientist Andrew Glen.

“My great uncles talked about sticking willow branches into the river and pulling them out loaded with Ohio shrimp that they’d use as bait,” says Dave Herzog, MDC science supervisor. “But the numbers fell during the 1930s to 1970s with added pollution and habitat change.”

While Ohio shrimp also declined in the lower Mississippi River, by the 1970s none were believed to exist in Missouri. Then, in 1991, MDC researchers found some near Cape Girardeau when sampling aquatic species as part of the Upper Mississippi River Restoration Program’s Long-Term Resource Monitoring, which continues today.

Fish, vegetation, water, and land use data are all collected and analyzed as part of this multi-agency,



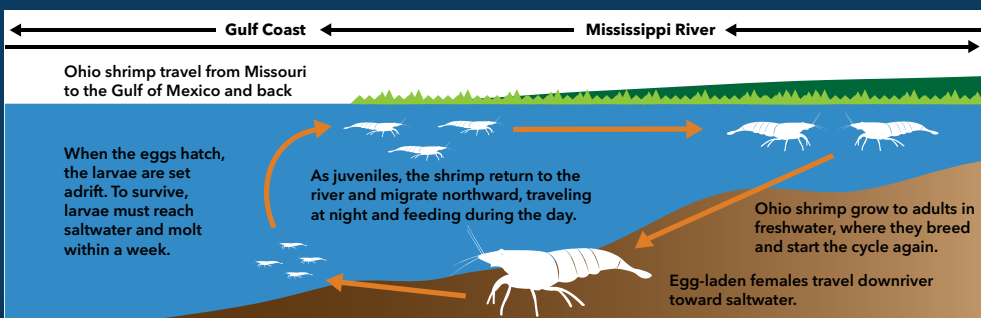
The Ohio shrimp (*Macrobrachium ohione*) is a species of conservation concern in Missouri. Found as far north as the Ohio River for which it was named, its numbers are now scarce north of southeastern Missouri. This freshwater shrimp grows to 3–4 inches in length.

MDC staff survey for Ohio shrimp in the Mississippi River as part of a larger, multi-agency monitoring project

multistate program. Data is shared among agencies to inform habitat restoration along the river and to gauge its success.

Traveling to and from the Gulf of Mexico, “Ohio shrimp serve as an indicator species for other critters and fish that move up and down the river or that need a flowing and open system to complete their life history,” Herzog says. “As both predator and prey, they’re an interesting example of how something relatively small can be super important to an ecosystem.”

Ohio Shrimp Surveys at a Glance



MDC monitors Ohio shrimp and other aquatic species as part of the Upper Mississippi River Restoration Program. This long-term project began about 35 years ago and involves multiple agencies across several states working together to monitor species and manage the Mississippi River and its habitats. Learn more at short.mdc.mo.gov/4Sx.

DAVE MURPHY RECEIVES MASTER CONSERVATIONIST AWARD

FORMER COMMISSIONER
HONORED FOR A LIFETIME
OF CONSERVATION WORK

➔ MDC and the Missouri Conservation Commission honored Clark County native and lifelong conservationist Dave Murphy with the Master Conservationist Award on July 20 during a special presentation at the home of MDC Director Sara Parker Pauley.

"Dave Murphy has been and remains a tireless promoter and defender of conservation," said MDC Director Sara Parker Pauley. "He has spent his long and notable career going to great lengths to support conservation efforts, build conservation partnerships, and help others learn about nature."

After his college graduation, Murphy spent four years as a wildlife specialist for MDC and was the assistant science coordinator for Columbia Public Schools for four more years. He also worked as a regional director and field supervisor for the National Wild Turkey Federation where he greatly expanded the number of chapters in Missouri.

He also served as a board member for the Missouri Conservation Heritage Foundation and helped start the Missouri Legislative Sportsmen's Caucus, which supports hunting, fishing, and outdoor recreation.



Murphy also served as the executive director of the Conservation Federation of Missouri from 2003 to 2013, where he initiated and expanded numerous conservation programs in the state, including the Conservation Leadership Corps, Share the Harvest, and the Governor's Youth Turkey Hunt. Murphy retired from the Conservation Federation in 2013.

In 2014, he accepted a six-year appointment by Missouri Governor Jay Nixon as a conservation commissioner.

Throughout his career Murphy has been recognized by his peers for his contributions to conservation. He has received the E. Sydney Stephens Award from the Wildlife Society, the Citizens Award from the American Fisheries Society, and the Tree Farmer of the Year award from the Society of American Foresters. In 2009, Outdoor Life magazine named him as one of the "25 Most Influential People on the Future of Hunting and Fishing."

Learn more about the Master Conservationist Award at short.mdc.mo.gov/Zyp.



JASON SUMMERS NAMED DEPUTY DIRECTOR OF RESOURCE MANAGEMENT

Congratulations to Jason Summers, who was recently named MDC's new deputy director for resource management. Summers will assume his new role upon the retirement of current Deputy Director Mike Hubbard on Sept. 23. Summers is currently the Science Branch chief for MDC where he leads a team of more than 80 scientists who specialize in fish, forest, and wildlife research and management.

Read more from the MDC online *Newsroom* at short.mdc.mo.gov/4SA.

TURKEY HUNTERS: SUBMIT FALL FEATHERS

MDC is again asking Missouri turkey hunters to save and submit feathers from birds they harvest this fall for a research project to improve our ability to estimate turkey abundance across Missouri.

Hunters who successfully harvest a turkey during either the archery deer and turkey season or fall firearms turkey season can voluntarily submit feathers from their turkey at no cost. Interested hunters are asked to retain a wing and three to five feathers from the breast after Telechecking their turkey. MDC will mail a feather submission packet, including a postage-paid return envelope to submit feathers at no cost.

To receive a feather submission packet, register at mdc.mo.gov/turkeyfeathers.

Ask MDC

Got a Question for Ask MDC?

Send it to AskMDC@mdc.mo.gov or call 573-522-4115, ext. 3848.

Q: What kind of spider is this?

➔ This is an arrowshaped micrathena (*Micrathena sagittata*).

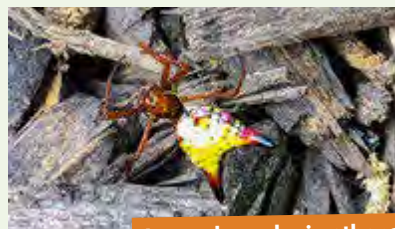
Female micrathenas spin intricate, circular webs where they commonly are seen resting. The males are small and rarely seen.

Protruding from the females' yellow abdomens are three pairs of tubercles, tipped with black and red at the base. With a little imagination, these spiders' abdomens resemble a rock musician's "Flying V" electric guitar.

As orbweavers, micrathenas capture small insects in the strands of their webs and deliver enough venom to subdue their prey. The spider then waits, returning later to ingest the prey's liquifying innards.

Although they are ferocious predators of small insects, these spiders — by reducing the number of mosquitos and leaf hoppers — perform a valuable service to humans as a type of natural, nontoxic pest control. Hummingbirds, vireos, and warblers harvest the webbing to use in building their own nests. And many birds steal trapped insects from the spiders' webs to eat themselves.

Micrathenas prefer open woods and backyards. For more information, visit short.mdc.mo.gov/4Su.



Arrowshaped micrathena



Wood ear mushroom

Q: Can you identify this mushroom?

➔ This mushroom is commonly called wood ear or jelly ear (*Auricularia americana*).

This reddish-brown to grayish-black mushroom is in season from May through November. It tends to grow in groups on the decaying wood of hardwoods or conifers, especially in rainy, damp conditions. A tell-tale characteristic is this mushroom's gelatinous flesh. Although it can be confused with other cup fungi, wood ear is rubbery, not brittle, and grows in irregular shapes.



Q: I came across this cylinder "nest" made of leaves. Can you tell me more about it?

➔ This may be the work of the Christmas fern leafroller caterpillar (*Herpetogramma sphingalis*).

Scientists believe the caterpillars construct these leaf balls as shelters to avoid predators. The caterpillars also feed on the innermost fronds and defecate there, too, further

obscuring their presence from predators. But they don't damage the host fern enough to significantly harm the plant.

This species prefers the shady areas of dry forests. Adult moths can be seen from May through September. The unmemorable, grayish-brown moths range from Canada to Georgia and west to Missouri.



Eric Abbott

CONSERVATION AGENT
LIEUTENANT *for* ANDREW,
ATCHISON, BUCHANAN,
HOLT, AND NODAWAY
COUNTIES

offers this month's

AGENT ADVICE

September ushers in the fall hunting season in Missouri. Amongst the available seasons and methods, one stands out as ideal for introducing youth to the sport of hunting — dove season. The flurry of action in a dove field will capture and keep a youth's interest. Plus, they will have ample opportunity to use their wingshooting skills. Youth under 15 do not require a permit to dove hunt. Be sure to practice shooting and gun safety prior to hunting. To find ranges or dove management areas near you, visit short.mdc.mo.gov/Z9o. For more information about dove season, consult the *Migratory Bird and Waterfowl Hunting Digest 2022–2023* at short.mdc.mo.gov/4SZ.

What IS it?

Can you
guess this
month's
natural
wonder?

*The answer is on
Page 9.*





ENDANGERED

Gray Bat

(*Myotis grisescens*)

The U.S. Fish and Wildlife Service (USFWS) listed the gray bat as a federally endangered species in 1976. Hibernating populations of gray bats concentrate in caves across Alabama, Arkansas, Kentucky, Missouri, and Tennessee, but in the summer, these bats migrate, extending their range. Gray bats roost in caves, mines, and quarries, but also use structures like bridges, culverts, dams, and storm sewers. At night, they emerge from their roosting habitat to forage on insects, particularly beetles and caddisflies, in addition to flies, moths, and stoneflies.



WHY IT'S IMPERILED

Historical threats include human disturbance to roosting bats, environmental contamination, impoundment of waterways, roost modification or destruction, cave commercialization, improper gating of caves, and natural calamities. Emerging threats include climate change, collisions with wind turbines, and wildlife diseases, like white-nose syndrome (WNS), which has decimated populations of several North American bat species, but fortunately appears not to have impacted gray bat populations.

MDC RESTORATION EFFORTS

MDC collaborates with numerous agencies, non-government organizations, and private partners to further the research, understanding, and recovery of gray bats. On MDC lands, we minimize disturbance to cave entrances and the surrounding landscape to promote gray bat use of the habitat. In addition, MDC caves are closed to the public in response to WNS. Range-wide recovery efforts for this species have been successful with population estimates increasing for more than a decade.

WHAT CAN YOU DO?

Avoid disturbing roosting bats. Enter cave environments only under the supervision of experienced individuals, with landowner permissions, and while following proper decontamination and safety procedures.



CONTRIBUTE TO BOWHUNTER OBSERVATION SURVEY

MDC encourages bowhunters to help monitor the state's wildlife populations by reporting sightings through the Bowhunter Observation Survey at short.mdc.mo.gov/4TQ.

Participants record sightings of wildlife — such as coyotes, foxes, deer, wild turkeys, and raccoons — observed while hunting. The survey period starts Sept. 15 and runs through the start of the November portion of firearms deer season.

Past survey participants received paper diaries from MDC to record their sightings. Now, an electronic version is available to make the survey more accessible and the results quickly summarized.

JOEL VANCE INDUCTED INTO CONSERVATION HALL OF FAME

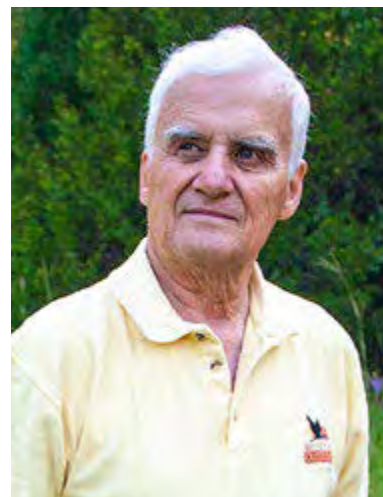
MDC posthumously honored Joel Vance, formerly of Russellville, by inducting him into the Missouri Conservation Hall of Fame on June 17 during a ceremony at the Runge Conservation Nature Center in Jefferson City. Vance died on Dec. 9, 2020, at age 86. Vance is the 45th inductee into the Missouri Conservation Hall of Fame. Learn more at short.mdc.mo.gov/ZyG.

Vance was nominated by family members, who accepted the award in his honor.

"Over the decades of his employment with MDC from 1969 to 1991, Vance contributed to the department by being the highly respected and widely heard clarion voice of conservation in the state, giving talks on behalf of the department, conducting seminars and workshops, and helping establish a Public Affairs section for MDC in 1986," said MDC Director Sara Parker Pauley during the award event. "Most notably, he wrote the *Design for Conservation*, which established a dedicated sales tax for conservation in 1976."

Vance also authored many books about conservation topics of all kinds, which showcased his wit, humor, and love of conservation efforts.

Vance was also deeply involved in the conservation movement, serving as president and chairman of the board of directors of the Outdoor Writers Association of America (OWAA) and the Missouri Outdoor Communicators, as well as an active member of the Association for Conservation Information, the Southeastern Outdoor Press Association, and the Association of Great Lakes Outdoor Writers.



WHAT IS IT? RED-EARED SLIDER

Red-eared sliders are one of Missouri's most common semi-aquatic turtles. Their olive-brown shells cover their body, which is dark green and covered in a pattern of black and yellow lines. Their most distinguishing feature is an elongated, broad red or orange stripe behind each eye. Red-eared sliders spend most of their time basking on logs and rocks. The name "slider" comes from their habit of sliding quickly into the water from these basking spots.





I Bought Native Plants...

Now What?

FINDING SPACE IN YOUR YARD FOR NATIVE PLANTS

by **Holly Dentner**

Monarch on swamp milkweed

PHOTOGRAPH BY
NOPPADOL PAOTHONG





Remember the rule of thumb for native gardens is sleep, creep, leap. The first year the plants are establishing their root systems. The second year they won't do much in terms of growth. The third year is when they leap, and you'll notice how they're growing and filling in the space.



Your motivation comes from a good place. You want to try something new in your garden or yard. Something that gives you a burst of summer color, but is also environmentally beneficial, attracting pollinators or providing food for birds and other wildlife.

You heard about the native plant sale at the nearby nature center, so you jump in the car and load up on milkweed, coneflowers, asters, and maybe even a ninebark and a redbud. Now you have a flat of plants and no idea what to do with them.

Not to worry! They're native, and they're meant to thrive in Missouri's climate. All you need is some prep work and to make sure you find the right spot to plant them. Before you put on your garden gloves, check out these entry-level tips on working natives into your landscape.



Top: MDC Native Landscape Specialists Alix Daniel (left) and Cydney Ross (right) leading a group hike in the Kansas City region.

Bottom: Imagine a sunny corner of your yard full of the lilac flowers of aromatic aster, which bloom July through November.



First, Why Choose Native Plants?

Understanding how native plants function in the ecosystem will cement their value in your yard. A quick Google search will show you they can be just as beautiful and showy as the nonnatives you'll find at the big box stores. Unlike those colorful annuals, native plants have evolved with Missouri's native fauna, which means they bring a multitude of benefits along with their beauty.

They serve as hosts for insects and are a food source for birds. They provide shelter for birds and other wildlife. They build deep root systems that hold soil in place, which prevents erosion and provides built-in stormwater management. They're also more sustainable because they require less water and don't need to be fertilized.

Alix Daniel and Cydney Ross are native landscape specialists who work at MDC's Anita B. Gorman Conservation

Discovery Center in Kansas City. They spend their days tending the grounds at the center and teaching others about the connection between native plants and native wildlife.

"Everything in nature is connected, from the tiniest organisms to the biggest predators," said Daniel. "Native plants have evolved over thousands of years, and they provide food and habitat for everything on this spectrum, including humans."

A native garden, even a small one in your yard, becomes part of the larger habitat that native wildlife will rely on. Ross says people ask her all the time about why they don't see birds or butterflies in their yards. The culprit is what's missing from your neighborhood.

"We have created food deserts by having turf grass lawns and nonnative shrubs and trees," she said. "They're just not offering the critical food supplies birds and butterflies need."

Replacing a portion of your yard with a native plant garden provides an oasis in the desert. Just planting an oak tree will support hundreds of varieties of caterpillars, which fuel the earth's food web. In fact, oaks support more life forms than any other North American tree, providing food, protection, or both to countless animals, birds, insects, and spiders.

Want more goldfinches in your neighborhood? They love coneflowers, goldenrod, and ironweed because those plants serve as seed sources. Monarch butterflies rely on milkweed. Other butterflies and critical pollinators look for wild bergamot, eastern blazing star, and aromatic aster, among many other plants. Native shrubs like American beautyberry, possum haw, and arrow wood provide berries for all sorts of birds and wildlife.

Make native plants a group project by working with your neighbors to establish a native plant garden in a communal space.



Assess Your Yard

Before you start planting, take some time to think about your property and where the new plants would thrive. The most important consideration is sunlight. A lot of native wildflowers need at least six hours of sunlight, but many thrive in shade, too. Prairie blazing star will flower from July through October in the bright, full sun, where a wild hydrangea can handle shadier spots. Daniel and Ross recommend keeping track of what time of day the sun hits various spots in your yard, which should guide you in finding just the right location for your recent impulse purchases.

Soil is another important factor. There are three basic types of soil structure: sandy, clay, and loam. Clay soil is sticky when wet, forms hard lumps when dry, and cracks in hot weather. Sandy soils let moisture drain away quickly, taking nutrients with it.

“Many people in Missouri will have clay soil in their yards because when their homes were built, most of the rich topsoil was removed and it’s just the compacted

clay soil that’s left,” said Daniel. “You can find native plants that handle the clay but mixing in some organic matter such as composted plant material will help.”

Think about how much moisture is in your soil. Does the rainwater pool anywhere in your yard? Target those areas with plants that can handle soggy conditions, or plant a rain garden that will filter, store, and slowly release the stormwater. Daniel and Ross recommend checking out native landscapes that match your yard conditions for more ideas.

“Go to a nearby natural area and look at those native plant communities,” said Ross. “If your yard gets lots of hot, direct sun, check out a native prairie and see what’s growing there, and discover more native plants you might like.”

“If you’ve got a lot of shade, go to a conservation area or state park with woodlands or forests and use that as a guide to inform the plant choices in your yard,” Daniel added. “I love the idea of finding inspiration out in nature, and it’s a great excuse to explore.”



Remove the Invasive Invaders

Planting natives is one of the most important things you can do to promote biodiversity and environmental health in your yard. Equally important is the removal of invasive species. There are plenty of nonnative perennials, shrubs, and trees that aren't invasive. Nonnative hostas or irises, for example, won't necessarily harm the Midwest ecosystem. They just don't provide the same benefits of native plants.

What does cause problems? Nonnative plants that spread aggressively. Many have spread beyond our backyards because there are no natural defenses to prevent them. What makes things even more difficult is that invasive plants and trees are often available for sale at the chain home and garden centers where we shop.

One of the most problematic offenders is the Bradford pear tree, which is a cultivar of the Callery pear tree (*Pyrus calleryana*). While the tag might claim it to be sterile, it needs only to cross-pollinate with another cultivar of the Callery pear (such as the Cleveland select or autumn blaze) and it will spread into nearby fields and woodlands. These trees have been very popular landscape trees for decades because they grow fast and have showy spring blooms. If you've got one in your yard, have it removed and replace it with an American plum, eastern redbud, or serviceberry.

Japanese honeysuckle and wintercreeper are two other incredibly damaging nonnative invasive plants that are regularly found for sale. Japanese honeysuckle (*Lonicera japonica*) is a vine native to Japan that was first introduced in 1806 as an ornamental ground cover. It is found all over Missouri, spreading along the ground and forming dense mats. Like the Callery pear trees, it escaped cultivation and chokes out natives plants wherever it spreads.

Wintercreeper (*Euonymus fortunei*) is another home and garden center favorite that has become a serious threat to native plants. It spreads rapidly and replaces the early spring blooming plants.

"Not all nonnative plants are bad, but the ones that cause damage to the environment need your attention," said Ross. "They choke out other vegetation and release chemicals that deter native plants from growing. Most of the time they don't even offer much as a food resource for our insects and wildlife."

Take the time to properly research the best ways to remove invasive plants effectively. Pull them up, cut them down, dig them out. It will take persistence and hard work. Consider using herbicide to make the work a little more permanent. A carefully applied herbicide like a glyphosate mixture painted on cut stems will help kill the invaders for good. If you choose to use herbicides, read the label and do your research. MDC's invasive plants webpage, short.mdc.mo.gov/4SX, is a great place to learn more.

Callery pear trees may look lovely in the spring, but their impact on native trees and shrubs outweighs any aesthetic qualities. These pear trees have escaped cultivation and spread everywhere, along power lines and highways, open fields, parks, and in the understory of forests.



Callery pear

Tips for Fall and Winter

Fall is a great time to plant native trees and shrubs. The cooler air and still-warm ground is ideal for establishing root systems. Give them plenty of water and don't forget to mulch. Any time of year, mulch will help maintain soil moisture and control weeds. Use organic mulch made of wood chips, pine needles, shredded bark, or compost mixes and leaves. Keep in mind that too much mulch can prevent ground-nesting native bees from accessing soil to create nests.

One big tip for fall and winter is to leave your yard as is. Leaving plant stalks and skipping raking leaves means habitat for insects and better soil composition down the road.

"Not raking your leaves is a big deal, we know," said Daniel. "If you can make it fit with your yard aesthetic, leave the leaves and dead plant stalks. They become a food source for birds, you'll help the plants to seed themselves and leaving all that organic material to break down in a natural way."

Daniel and Ross find beauty in winter plants, too.

"One of my favorite plants is rattlesnake master," said Daniel. "It provides so much winter beauty, and it has lovely base foliage that can be woven into cordage. It's got gorgeous upright stems that withstand winter weather and the flower-heads are very similar to how they look in the spring."



Where to Learn More

It's time to plant. Give your native plants plenty of water and enjoy them for years to come. But if you feel the urge to visit the native plant sale again, do a little research first. There are excellent resources to learn more about adding native plants to your landscapes.

MDC and the Missouri Prairie Foundation's Grow Native! Program offers detailed information at **gownative.org**, including a database of native plants, a directory of native plant nurseries, landscape designs, and webinars and plant sales happening throughout the state.

Native Plants for Your Landscape is a free MDC publication for Missouri residents. The 12-page booklet outlines where and how to plant natives. Find it online at **short.mdc.mo.gov/Zc8** or request a free print copy by emailing pubstaff@mdc.mo.gov.


If you have a larger property, consider ordering bare root seedlings from MDC's George O. White State Forest Nursery. They start taking orders on Sept. 1 and ship the following spring. Learn more at **mdc.mo.gov/seedlings** or check out the *Seedling Order Form* insert (between pages 16 and 17) in the *September Conservationist*.

Learn directly from Daniel and Ross's expertise. They partner with Deep Roots Kansas City to hold *Natives at Noon*, a once-a-month workshop series on native plant topics. Their archived workshops are online through the *Webinars* tab at **deeprooots.org**.

Deep Roots and other partners are presenting the 2022 Plan It Native Conference on Sept 12-16. The virtual conference will offer more than 20 live, interactive sessions and three keynote speakers, plus an in-person exhibit and field trips in and around Kansas City for those living nearby. Learn more at **planitnative.org**.

If you're ready to buy more native plants right now, check out the schedule of native plant sales happening in September. There are at least six sales happening this month, with plants supplied by Grow Native! professional members. Find the full schedule and details at **gownative.org**, under the *Events* tab. ▲

Holly Dentner is a natural resources communications specialist at MDC. She plans to incorporate aromatic aster, Missouri primrose, and blue wild indigo into her sunny front yard.



Regal Fritillary

TENDING TO THE QUEEN OF THE PRAIRIE

story by Noppadol Paothong and Chris Barnhart
photographs by Noppadol Paothong

The regal fritillary is a large, beautiful, and distinctive butterfly that is almost completely confined to high-quality native tallgrass prairies. Due to habitat loss, the future of this species may be in peril, but conservation efforts and research at Missouri State University (MSU) are giving it a fighting chance.

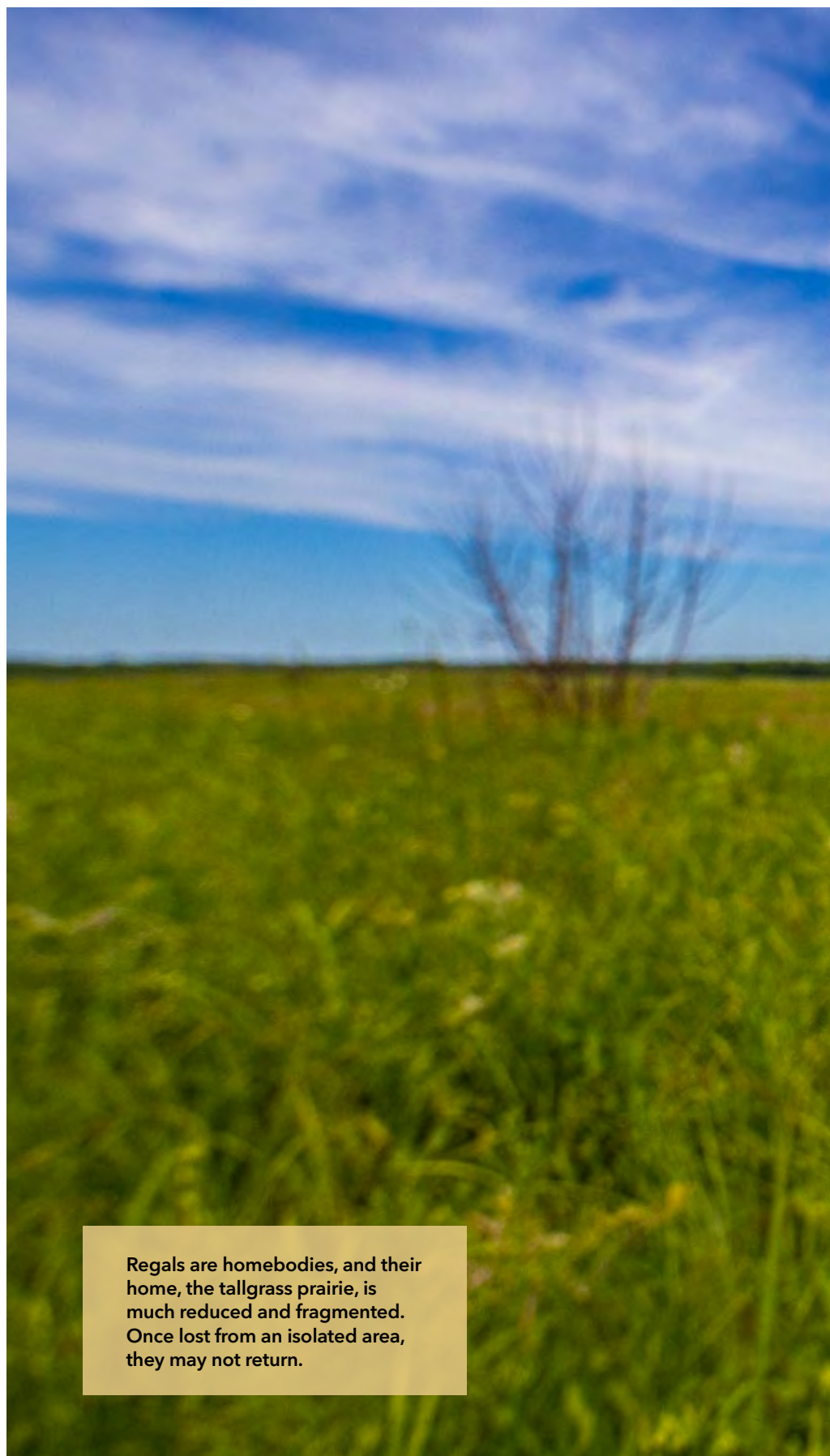
If you happen to spot an orange-and-black butterfly flutter over a prairie, like most people, your first thought might be, it's a monarch butterfly. But you may want to take a second look. It could be a rare regal fritillary butterfly (*Speyeria idalia*).

Once common in Missouri, regal fritillary butterflies have now become a rare sight. Of the 16 species of *Speyeria*, only three live in Missouri.

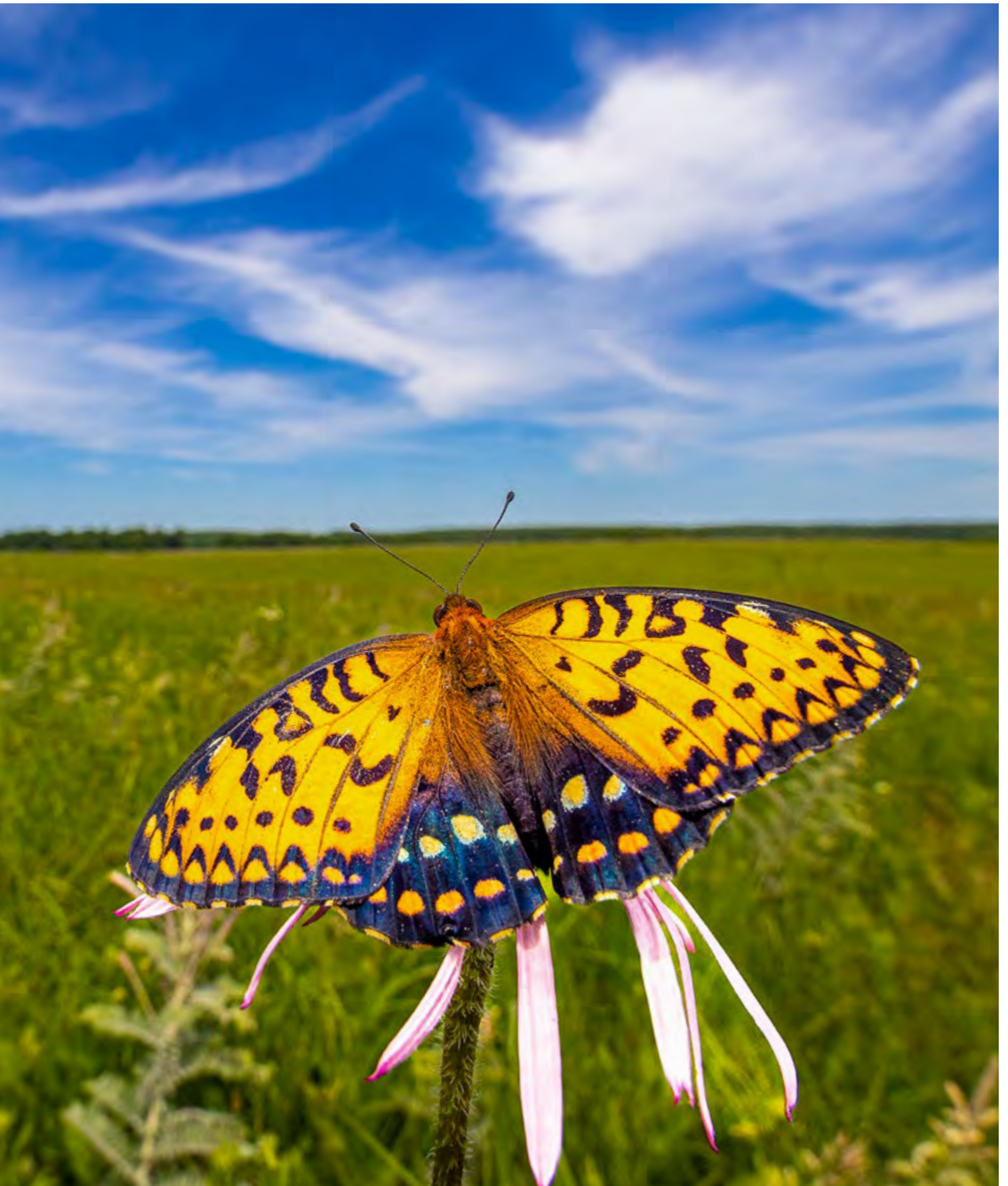
The greatest threat to the regal fritillary is habitat fragmentation. Once covering nearly one-third of America, prairies have become rare and is one of the most endangered ecosystems in the world. While Missouri was once covered by 15 million acres of tallgrass prairie, today 99 percent of tallgrass prairie has been lost. The impact of the loss was felt by specialist species, like the regal fritillary, that depend on plants found only in this habitat.

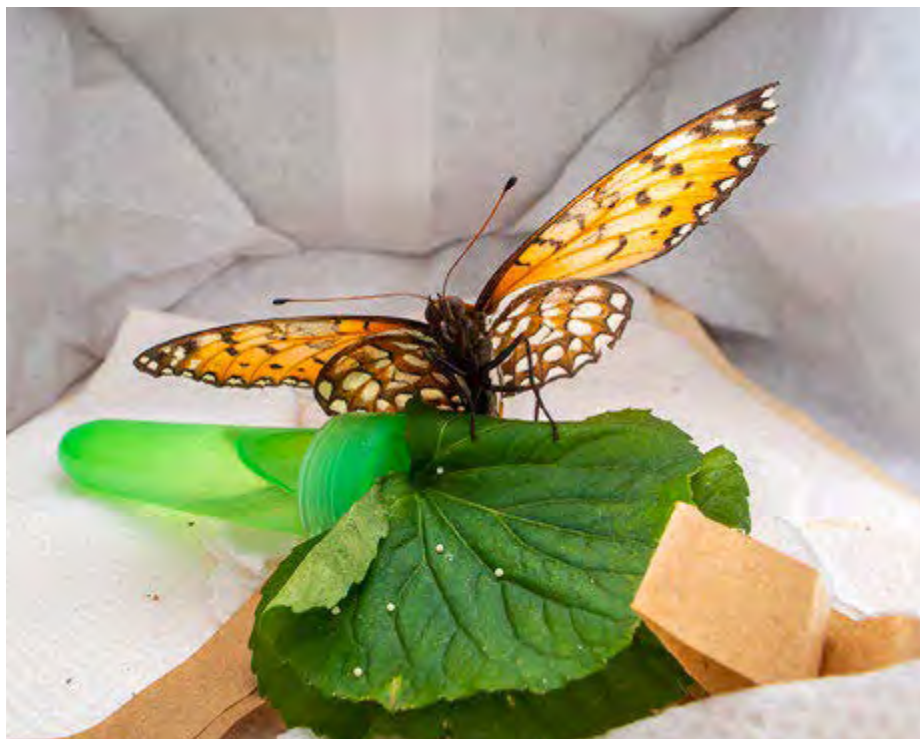
The larval food source for the regal fritillary and all members of the genus *Speyeria* are violets. Various violet species are associated with the different areas of the regal fritillary's range; however, the bird's-foot violet (*Viola pedata*) and the prairie violet (*Viola pedatifida*) tend to be the preferred larval food source for the regal fritillaries in Missouri. While monarch butterflies can adapt to both field and meadows during their long migration, regal fritillaries are restricted to tallgrass prairies and stay in Missouri as caterpillars until spring. As adult butterflies, however, they may feed on a variety of nectar plants such as milkweed, coneflower, blazing stars, bergamots, clovers, goldenrods, and ironweeds.

Drastic declines in regal fritillary populations have led to concern about the butterfly's future. However, due to a two-year project, regal fritillary butterflies might have a fighting chance. MDC, with help from Missouri State University (MSU), is examining the butterfly's reproduction, developing methods to raise them in captivity, and introducing them to suitable sites.



Regals are homebodies, and their home, the tallgrass prairie, is much reduced and fragmented. Once lost from an isolated area, they may not return.



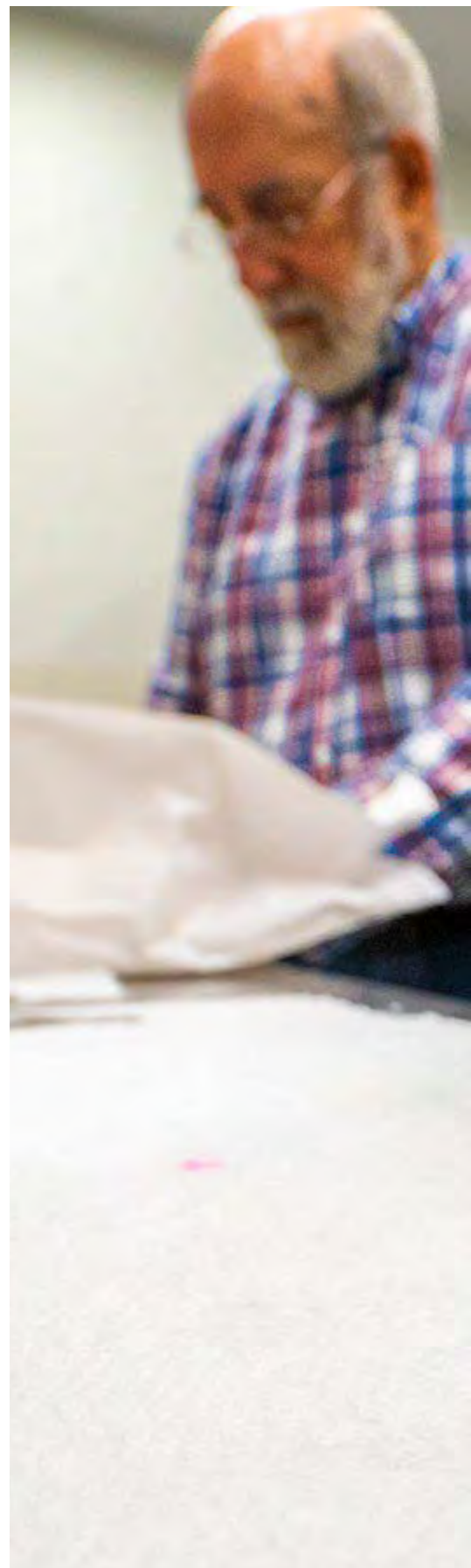


A female regal fritillary being kept inside the MSU lab, where she will continue to lay 2,000 eggs or more (50 per day) while she is in captivity. Females will lay eggs on host plants, such as prairie violets, which tend to be preferred larval food. Next spring, both caterpillars and butterflies that hatched in captivity will be taken to suitable sites for release.



Eggs of regals kept in controlled humidity showed more tolerance to dehydration than the eggs of the related great spangled fritillary and were able to delay hatching in response. Humidity and temperature also strongly affected overwintering success. These factors may explain how regals succeed in prairie habitats.

Right: Fritillaries are cooperative captives. This female is drinking artificial nectar while her eggs are being counted. Females must continue to feed during the summer and particularly during September when they lay their eggs.





Regal Fritillary: In Four Stages

Regal fritillary butterflies have four stages in their life cycle. They are also univoltine, which means they only reproduce a single generation per year. Adult butterflies emerge in June and mating takes place in late June and early July. After mating, females enter a six-to-eight-week period of reproductive diapause, and oogenesis does not initiate until late August. Once oogenesis takes place during a fall season, the eggs are fertilized and soon after, oviposition occurs.

A female can lay more than 2,000 eggs during her life span. The small larvae hatch in late September and into October. Immediately after hatching, the tiny larvae seek protective covering in the leaf litter and overwinter there. At this stage, the larvae delay development over the winter months, and this is known as larval diapause. Once spring arrives, the larvae emerge and begin feeding on violets.

It takes about a month for a regal fritillary butterfly to mature, in comparison to other species like monarch butterflies that can go from an egg to chrysalis in just two weeks. While most butterflies will overwinter as an egg or a pupa, which are more stable ways to overwinter, fritillaries overwinter as caterpillars. They grow and mature through six instar stages until late May when they pupate. Adults emerge in June, males first, followed by females about two weeks later, and the cycle starts over again.

Inset: Two tiny eggs deposited on a host plant. After hatching, caterpillars will emerge and feed on the plant. The eggs hatch in late summer or fall, but the early-stage caterpillars do not eat; instead, they overwinter in leaf litter.

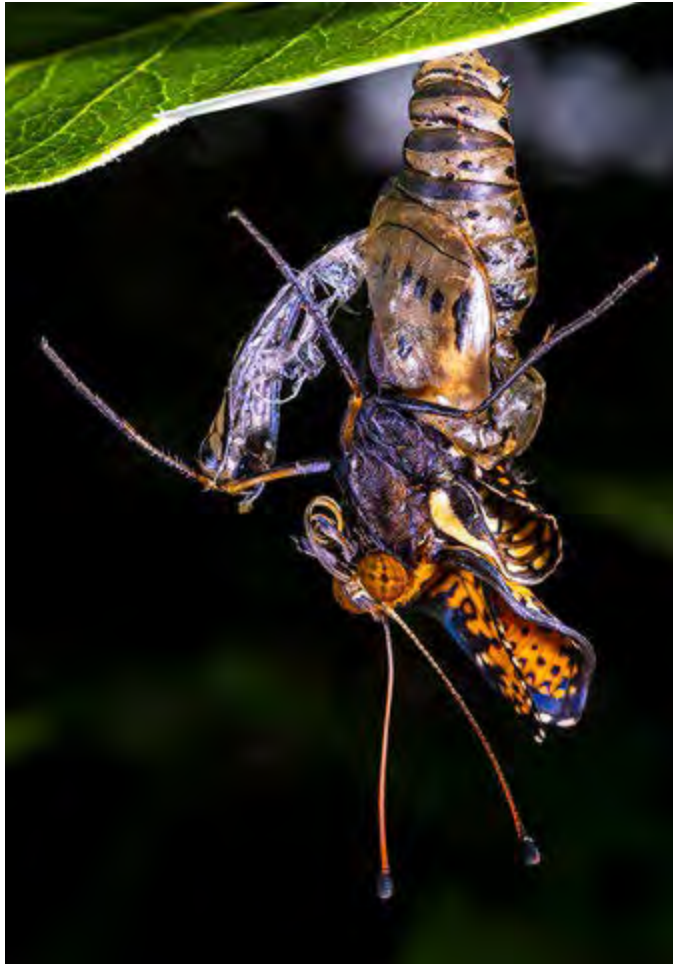
A third instar caterpillar crawls around its host plant before it continues to feed. In spring, the caterpillars come out of hibernation and feed on the tender new leaves of early-spring violets. The caterpillars grow relatively slow and enter the pupa stage in late spring.





After staying in pupa stage for two weeks, a butterfly slowly emerges from its chrysalis. The adult males emerge in June, followed by the females, and the cycle begins again.

Inset: The most common fritillary in eastern North America, a great spangled fritillary (*S. cybele*), a close relative of the regal fritillary with similar habitats. However, regal's hindwings are distinctively blackish-gray and filled with bright silvery spots.



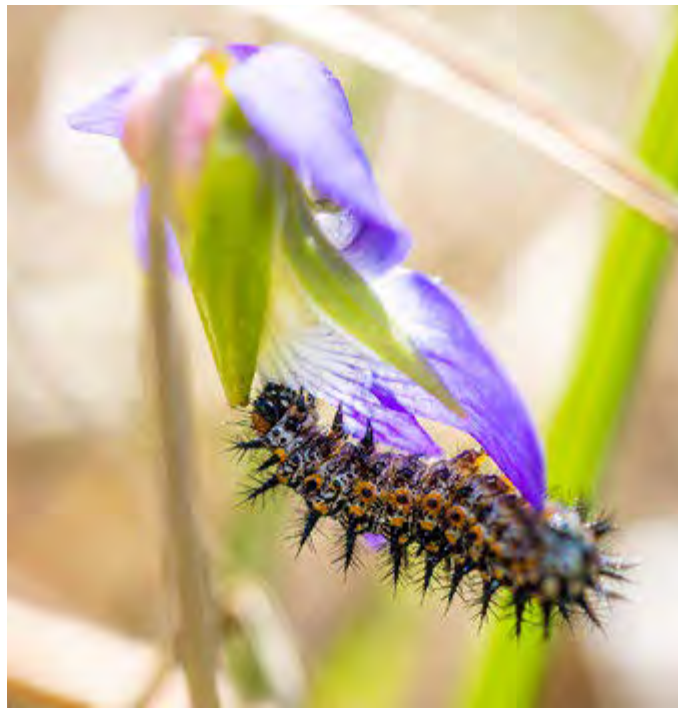
Great spangled fritillary





Adult regal fritillary butterflies will stay within prairie habitats during the summer and fall. Unlike most other butterflies, regals reproduce just once a year. They mate in June but do not lay eggs until September. Female regals must survive for three months of summer, much longer than most butterflies.





A newly released regal fritillary feeds on prairie violet at one of the release sites during early spring when caterpillars become more active.



Each adult butterfly raised in captivity is marked on the hindwing before being released on the prairie. This mark will help identify captive populations and their survival rates in fall.

Left: Dr. Chris Barnhart, a professor at MSU, released an adult regal fritillary on a prairie during early summer. Captive culture can provide a mechanism to restore lost populations as well as opportunities to understand factors that help regals thrive.

Get Outside

in SEPTEMBER



Shellbark hickory



Pecan



Ways to connect with nature

SOUTHEAST REGION

National Hunting and Fishing Day

Saturday • Sept. 24 • 10 a.m.–4 p.m.

Lake City Shooting Range, 28505 E Truman Road, Buckner, MO 64016

No registration required; for more information, call 816-249-3194.

All ages

The Lake City Range is happy to open its doors to the public with a free day of shooting in celebration of National Hunting and Fishing Day. Everyone is welcome. Come hone your skills on the trap or skeet fields, archery fields, or on the rifle or pistol ranges. All shooters must provide their own firearm and ammunition. We'll see you on the range.

Fall Gets Nutty

Hickory nuts, including those of pecan and shellbark hickory, some of Missouri's tastiest species, ripen and begin to fall. Missouri is the top producer of another ripening nut — the black walnut. It's a good time to get out there and gather. But you better be quick. You will be competing against squirrels, deer, and other wildlife stocking up for the coming winter months.



Ironweed



Sunflower



Thoroughwort

Fall Color — Not Just for Trees

Much of our early fall color in Missouri occurs along roadsides, where native wildflowers — including goldenrods, ironweeds, thoroughworts, sunflowers, native asters, crownbeards, and rosinweeds — bloom among grasses turned coppery or bronzy. Sumacs turn wine-red, completing the picture.

Natural Events to See This Month

Here's what's going on in the natural world.



American white pelicans gather at wetlands.



Elk begin bugling.



Three-toed box turtles enter overwintering retreats.

CROWNBEARD: CHRIS EVANS, UNIVERSITY OF ILLINOIS, BUGWOOD.ORG

Flowers to Frost Flowers

Dittany and yellow and white crownbeards produce abundant blossoms late in the growing season, which are important nectar sources for insects. They also provide a hunting place for the many insects and spiders that prey on nectar gatherers. These also are some of the species that can create frost flowers in early winter. Locate and ID them now when they're blooming and return to look for frost flowers in December.



White crownbeard

SOUTHEAST REGION

Women's Free Fishing Day

Saturday • Sept. 24 • 7 a.m.-8 p.m.

Bennett Spring Fish Hatchery

26142 Hwy 64A, Lebanon, MO 65536

No registration required; for more information, contact the hatchery at 417-532-4418 or Ben Haven at Ben.Havens@mdc.mo.gov.

All ages

Come out to the hatchery for a day of fun and fishing. Missouri is a great place to fish and Bennett Springs is one of the best places to get hooked. Women and girls of all ages fish for free.



A Horn of a Different Color

Hickory horned devils are the caterpillars of the regal moth, otherwise known as the royal walnut moth. Most people see these huge, colorful, horned larvae in late summer and early fall as they are creeping around, looking for a place to dig into the soil where they will overwinter. These hot-dog-sized, spiky caterpillars may be seen through October.

Conservation Nature Centers



BURR OAK WOODS

Blue Springs | mdc.mo.gov/BurrOakWoods

CAPE GIRARDEAU

Cape Girardeau | mdc.mo.gov/Capecnc

DISCOVERY CENTER

Kansas City | mdc.mo.gov/DiscoveryCenter

POWDER VALLEY

Kirkwood | mdc.mo.gov/PowderValley

RUNGE

Jefferson City | mdc.mo.gov/Runge

SHOAL CREEK

Joplin | mdc.mo.gov/ShoalCreek

SPRINGFIELD

Springfield | mdc.mo.gov/Springfieldcnc

TWIN PINES

Winona | mdc.mo.gov/TwinPines

Discover nature with us.

Places to Go

NORTHWEST REGION

Lake Paho Conservation Area

Good fishing and a little history
by Larry Archer

✧ A day on the water, dock, or bank of Lake Paho Conservation Area's (CA) namesake waterbody can yield several different catches and, if one is paying attention, a history lesson.

Now in its 75th year, Lake Paho, located in Mercer County, was the first built by MDC, with construction beginning in 1947. Lake Paho CA's name even reflects its special place in MDC history, said Wildlife Management Biologist Jonathan McCulley.

"It's actually Native American for 'one' or 'first,'" said McCulley. "This was the first lake that the department created."

Located west of Princeton on US Highway 136, the 273-acre Lake Paho offers anglers plenty of avenues for pursuing black bass, white bass, catfish, crappie, and more. Away from the water, the area's remaining 2,000-plus acres provides hikers, bikers, birders, and hunters with additional opportunities.

For those who want to make more than a day trip of their visit to Lake Paho CA, the area has three campsites, said Wildlife Crew Leader Darrel Cunningham.

"We have primitive camping, which pretty well means there's no electricity, no water," Cunningham said. "We do have gravel sites for RVs with grass in between them for tenters, and then we provide a pit toilet in each campground."



"You're looking at a mix of open grassland and then deciduous forest – forested fingers. It's on what's called the dissected till plains, so it's right there on the edge of what would've been historically where the prairie met the woods."

—Wildlife Management Biologist
Jonathan McCulley

DAVID STONNER











LAKE PAHÓ CONSERVATION AREA

consists of 2350.1 acres in Mercer County.
From Princeton, take Highway 136 west 4 miles,
then right on Fathom Street to the area.

40.3953, -93.6536

short.mdc.mo.gov/4SW 660-646-6122

WHAT TO DO WHEN YOU VISIT

-  **Birdwatching** The eBird list of birds recorded at Lake Pahó CA is available at short.mdc.mo.gov/4Sm.
-  **Camping** Three primitive campgrounds with 40 individual campsites.
-  **Fishing** 273-acre lake; black bass, catfish, crappie, sunfish, white bass.
-  **Hiking** Approximately 6 miles of field access trails.
-  **Biking** 2.4 miles of service road open to year-round biking.
-  **Hunting Deer and turkey** Regulations are subject to annual changes. Refer to MDC's regulation page online at short.mdc.mo.gov/4Sm for regulations.
Also **dove, quail, rabbit, and squirrel**
-  **Trapping** Special-use permit required.
-  **Waterfowl Hunting** Open hunting.

WHAT TO LOOK FOR WHEN YOU VISIT



Northern harrier



Northern bobwhite



Ring-necked pheasant



Prairie kingsnake



Showy Partridge Pea

Chamaecrista fasciculata

Status

Scattered to common

Size

Commonly 2 feet, sometimes nearly 3 feet

Distribution

Statewide



Did You Know?

Like other members of the bean family, showy partridge pea exhibits nyctinasty, meaning the plant closes its leaflets at night. This characteristic is thought to be an adaptation to control water loss or offer protection from herbivores.

Showy partridge pea is an annual that typically occurs in fields, pastures, along roadsides and railroads, as well as glades, upland prairies, openings in upland forests, savannas, ledges and tops of bluffs, and banks of streams and rivers. Its five-petaled yellow flowers, tinged with red at the base, bloom from July through October. The fruits of showy partridge pea are legumes that are 1-2½ inches long and turn black when they mature. Because showy partridge pea is in the bean family, these are literally bean pods. When mature and dry, the pod turns black and the two sides separate suddenly, flinging the seeds away.



HUMAN CONNECTIONS

This plant has incredibly interesting flowers. The special arrangement of flower parts encourages what is called "buzz pollination" by bumblebees, while ants visiting nectar glands in the leaf stems remove the plant's insect pests.



ECOSYSTEM CONNECTIONS

Showy partridge pea is an important food source for livestock and wildlife and is sometimes planted for that purpose. Its foliage is nutritious for deer and livestock, while quail, turkey, and other birds feed on the plant's seeds.

Outdoor Calendar

❖ MISSOURI DEPARTMENT OF CONSERVATION ❖



Free MO Hunting and MO Fishing Apps

MO Hunting makes it easy to buy permits, electronically notch them, and Telecheck your harvest. MO Fishing lets you buy permits, find great places to fish, and ID your catch. Get both in Android or iPhone platforms at short.mdc.mo.gov/Zi2.



FISHING

Black Bass

Impounded waters and non-Ozark streams:
Open all year

Most streams south of the Missouri River:

- ▶ Catch-and-Release:
March 1–May 26, 2023
- ▶ Catch-and-Keep:
May 28, 2022–Feb. 28, 2023

Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2022

Nongame Fish Giggling

Impounded Waters, sunrise to sunset:
Feb. 16–Sept. 14, 2022

Streams and Impounded Waters,
sunrise to midnight:
Sept. 15, 2022–Feb. 15, 2023

Paddlefish

On the Mississippi River:
Sept. 15–Dec. 15, 2022

Trout Parks

State trout parks are open seven days a week
March 1 through Oct. 31.

Catch-and-Keep:
March 1–Oct. 31, 2022

Catch-and-Release:
Nov. 11, 2022–Feb. 13, 2023

**Only hunters selected through a random drawing may participate in these hunting seasons.*

For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code of Missouri* at short.mdc.mo.gov/Zi2. Current hunting, trapping, and fishing regulation booklets are available from local permit vendors or online at short.mdc.mo.gov/ZZf.

HUNTING

Black Bear*

Oct. 17–26, 2022

Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2022

Coyote

Restrictions apply during April, spring turkey season, and firearms deer season.

Open all year

Crow

Nov. 1, 2022–March 3, 2023

Deer

Archery:

Sept. 15–Nov. 11, 2022
Nov. 23, 2022–Jan. 15, 2023

Firearms:

- ▶ Early Youth Portion (ages 6–15):
Oct. 29–30, 2022
- ▶ November Portion:
Nov. 12–22, 2022
- ▶ Late Youth Portion (ages 6–15):
Nov. 25–27, 2022
- ▶ Antlerless Portion (open areas only):
Dec. 3–11, 2022
- ▶ Alternative Methods Portion:
Dec. 24, 2022–Jan. 3, 2023

Dove

Sept. 1–Nov. 29, 2022

Elk*

Archery:

Oct. 15–23, 2022

Firearms:

Dec. 10–18, 2022

Groundhog (Woodchuck)

May 9–Dec. 15, 2022

Pheasant

Youth (ages 6–15):
Oct. 29–30, 2022

Regular:

Nov. 1, 2022–Jan. 15, 2023

Quail

Youth (ages 6–15):
Oct. 29–30, 2022

Regular:

Nov. 1, 2022–Jan. 15, 2023

Rabbit

Oct. 1, 2022–Feb. 15, 2023

Sora, Virginia Rails

Sept. 1–Nov. 9, 2022

Squirrel

May 28, 2022–Feb. 15, 2023

Teal

Sept. 10–25, 2022

Turkey

Archery:

Sept. 15–Nov. 11, 2022
Nov. 23, 2022–Jan. 15, 2023

Firearms:

- ▶ Fall: Oct. 1–31, 2022

Waterfowl

See the Migratory Bird and Waterfowl Hunting Digest or visit short.mdc.mo.gov/ZZx for more information.

Wilson's (Common) Snipe

Sept. 1–Dec. 16, 2022

Woodcock

Oct. 15–Nov. 28, 2022



Serving nature and you[®]



**Follow us
on Instagram**

@moconservation

Catch a glimpse of these ruby-throated hummingbirds (*Archilochus colubris*) as they visit nectar feeders and flowers. Soon, these tiny birds will make the long journey to southern Florida, southern Mexico, and even South America where they will winter. By October, they will be a distant memory until they return in April. Get outside and enjoy them while you can.

📷 by **Noppadol Paothong**

Free to Missouri households

To subscribe, cancel your subscription, or update your address, visit mdc.mo.gov/conmag.